

Name: _____ Date: _____

Polynomial Operations EXAM (version 115)

1. Let polynomials $p(x)$ and $q(x)$ be defined below.

$$p(x) = 9x^5 + 2x^4 - 5x^3 + 7x + 8$$

$$q(x) = -10x^5 + 5x^4 - 8x^2 + 4x + 7$$

Express the difference $p(x) - q(x)$ in standard form.

2. Let polynomials $a(x)$ and $b(x)$ be defined below.

$$a(x) = 2x^2 + 9x - 5$$

$$b(x) = -5x - 2$$

Express the product $a(x) \cdot b(x)$ in standard form.

3. Express $(x + 1)^6$ in standard (expanded) form.

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4. Let polynomials $f(x)$ and $g(x)$ be defined below.

$$\begin{aligned}f(x) &= x^3 + 12x^2 + 27x + 3 \\g(x) &= x + 9\end{aligned}$$

The quotient of $\frac{f(x)}{g(x)}$ can be expressed as a polynomial, $h(x)$, and a remainder, R (a real number).

$$\frac{f(x)}{g(x)} = h(x) + \frac{R}{x + 9}$$

By using synthetic division or long division, express $h(x)$ in standard form, and find the remainder R .

5. Let polynomial $f(x)$ still be defined as $f(x) = x^3 + 12x^2 + 27x + 3$. Evaluate $f(-9)$.